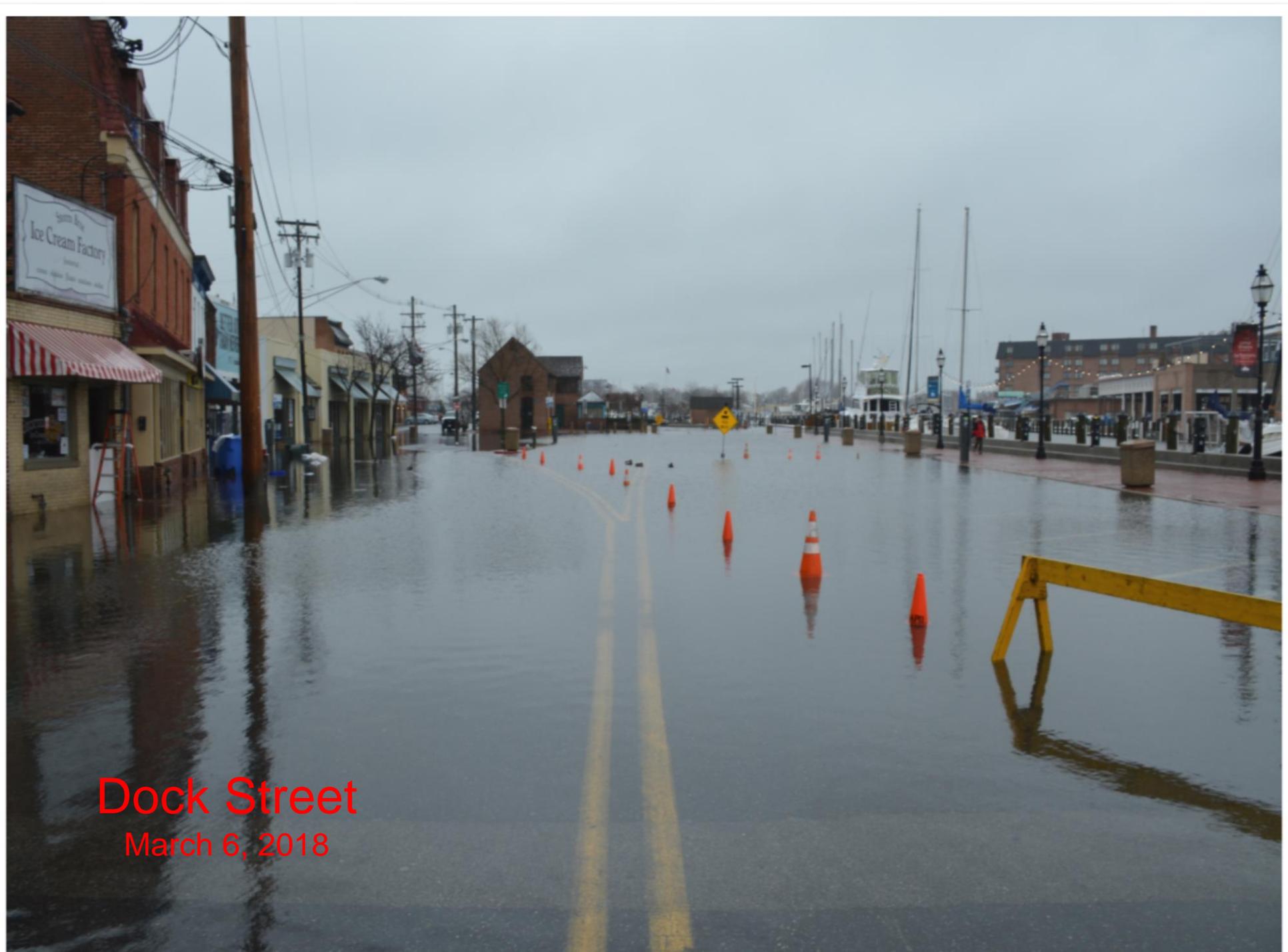


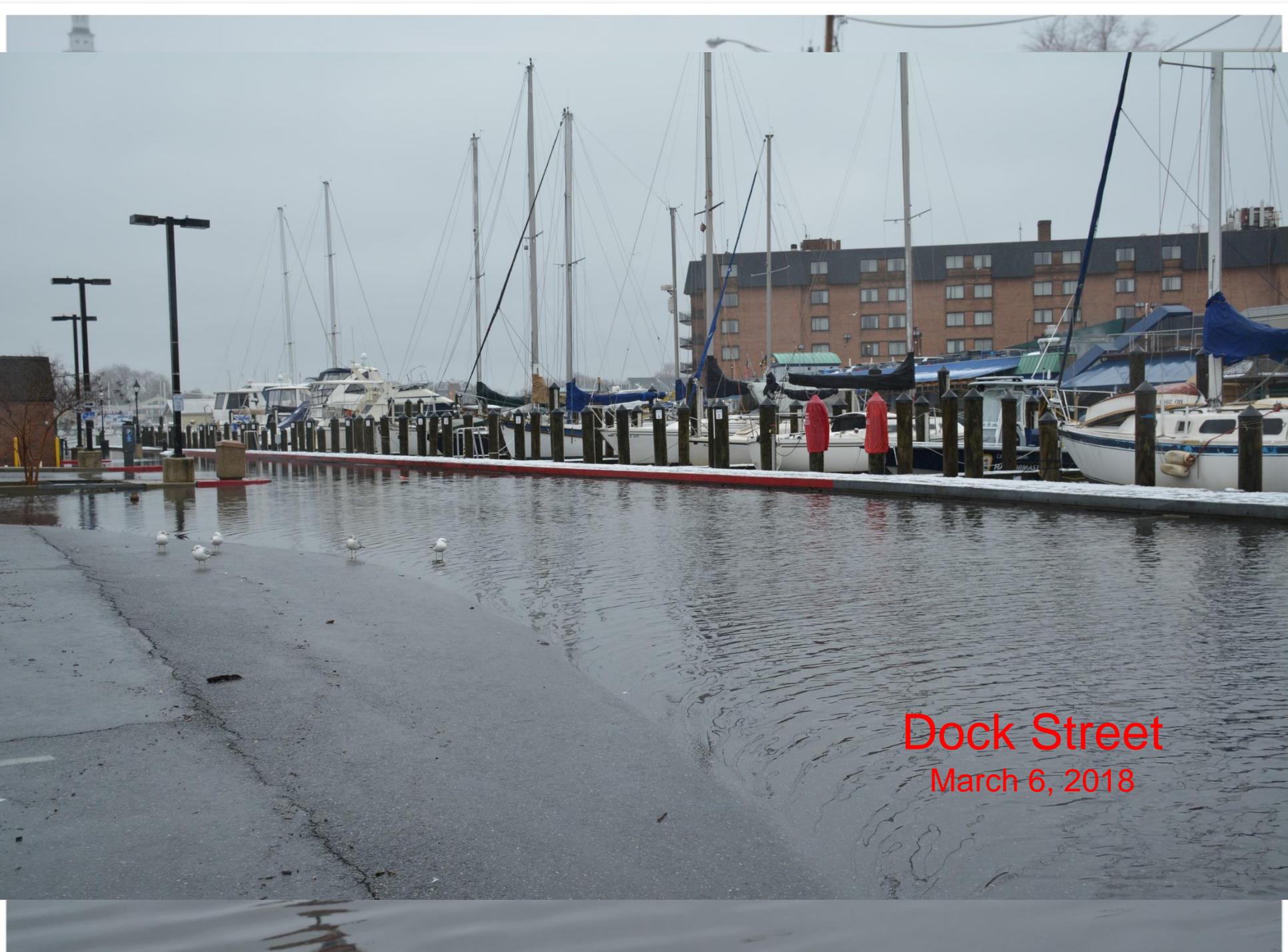
City of Annapolis City Dock Flood Mitigation

November 2018



Dock Street

March 6, 2018



Dock Street
March 6, 2018



Compromise Street
March 6, 2018



FLEET RESERVE CLUB



March 6, 2018



March 6, 2018



FLEET RESERVE CLUB

PARKING BY PERMIT ONLY

April 6, 2017



April 6, 2017

Overview

- Project Objective
- Project Drainage Area
- Existing System and Tidal Flooding
- Proposed Flood Mitigation Concept Design
- Considerations
 - Filtration
 - Location
- Layout Options
- Funding and Schedule



Project Objective

Reduce flooding at City Dock by eliminating the backflow of tidal water through the storm drain system and onto the adjacent streets.

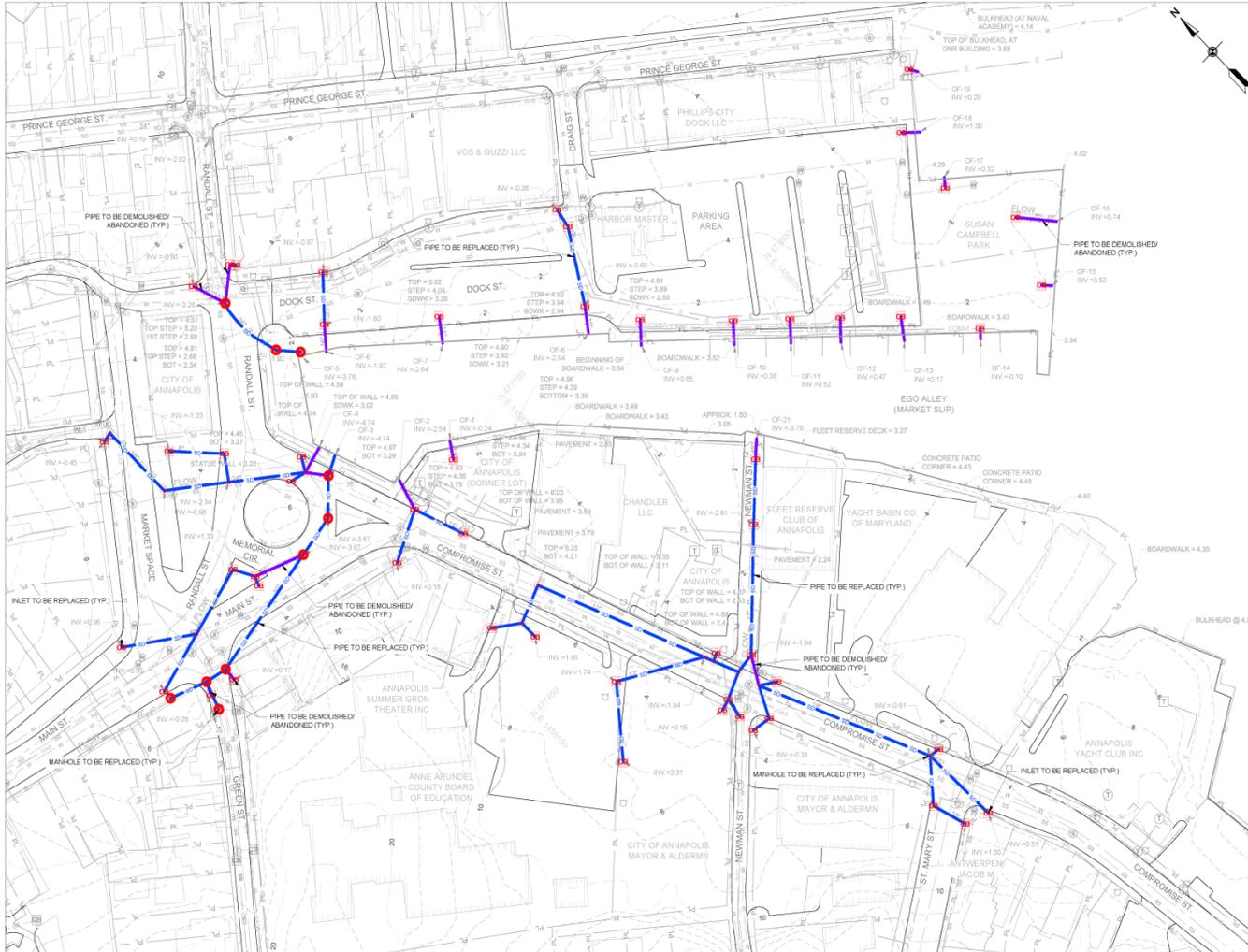
During September 2018, City Dock area experienced **12 days of flooding**, closing Compromise Street temporarily on 6 of those 12 days.



Project Drainage Areas



Existing Storm Drain System



GENERAL NOTES:

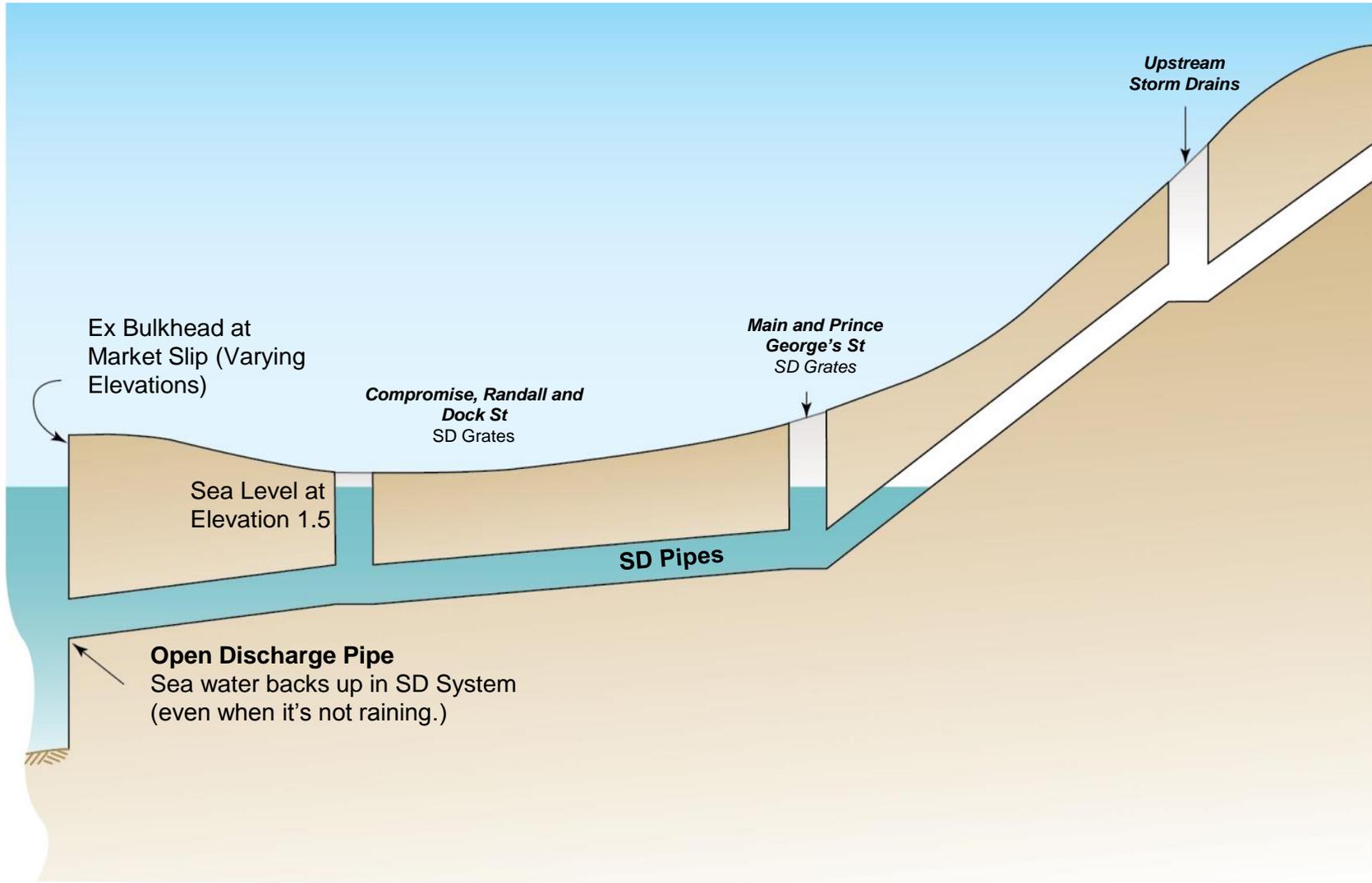
- EXISTING ABOVE GROUND STRUCTURES, ROADWAY ALIGNMENTS, STORM DRAIN LINES, SEWER LINES, WATER LINES AND TOPOGRAPHIC DATA ARE DERIVED FROM GIS DATA PROVIDED BY THE CITY OF ANNAPOLIS.
- LOCATIONS OF UNDERGROUND ELECTRIC LINES, OVERHEAD ELECTRIC LINES, POWER POLES, GAS LINE AND COMMUNICATION LINES ARE FOR INFORMATIONAL PURPOSES ONLY. PLEASE USE A LOCATING SERVICE FOR EXACT MARKINGS.

LEGEND:

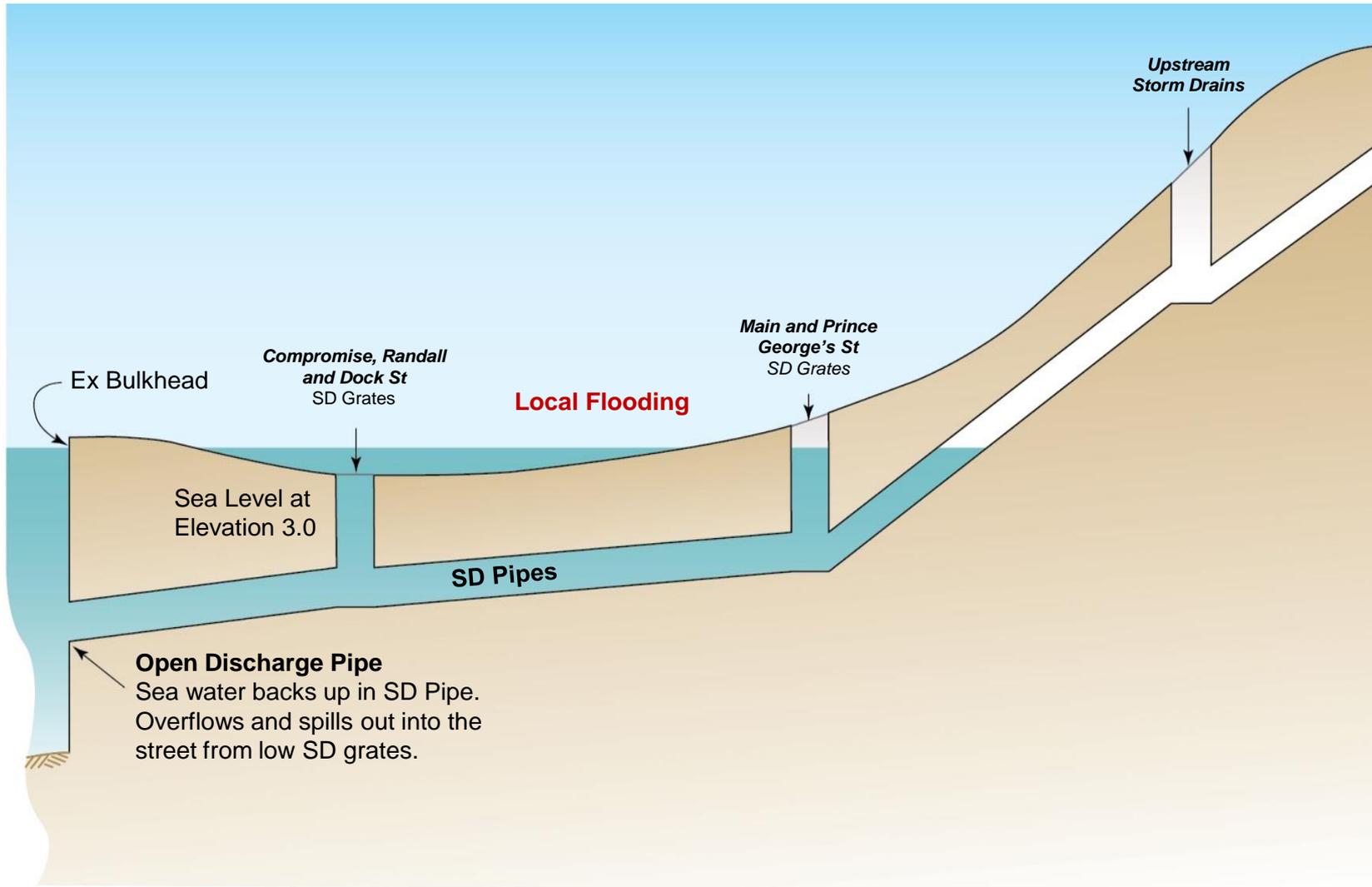
MAJOR CONTOUR	---
MINOR CONTOUR	---
PROPERTY LINE	---
ROAD CENTERLINE	---
STORM DRAIN LINE	---
STORM DRAIN MANHOLE	⊙
STORM DRAIN INLET	⊕
SANITARY SEWER LINE	---
SANITARY SEWER MANHOLE	⊙
WATER LINE	---
WATER STRUCTURE	⊕
UNDERGROUND ELECTRIC LINE	---
TRANSFORMER (UGE LINE)	⊕
OVERHEAD ELECTRIC LINE	---
TRANSFORMER (OHE LINE)	⊕
GAS LINE	---
GAS STRUCTURE	⊕
COMMUNICATION LINE	---
POWER POLE	⊕
STORM DRAIN LINE TO BE ABANDONED/DEMOLISHED	---
STORM DRAIN INLET TO BE REPLACED	⊕
STORM DRAIN MANHOLE TO BE REPLACED	⊙



Existing Storm Drain System During High Tide



Existing Storm Drain System During Extreme High Tide



Flooding Through Storm Drains = 1.9 feet NAVD88



Extreme High Tide (2016) = 2.7 feet NAVD88





Karna Karna-Hale Haly Memorial
An educational, inspirational, and healing place
inspired by the life and work of
Miss Haly's Boat Shop
Compassion of the sea was followed in their wake
September 1987 December 1990 and June 1992
Respectfully and lovingly dedicated
to Karna Haly-Hale, Miss Haly's Boat Shop
and the Haly family members
The Haly family members
The Haly family members
Thousands of people have been inspired by the
memorial and the Haly family members
The Haly family members
The Haly family members

March 6, 2018
Peak EL 3.52 MLLW =
EL 2.65 NAVD88

Ten Year Storm Elevation= 3.7 feet NAVD88



Base Flood Elevation (100-Yr Storm)= 5.0 feet NAVD88



Hurricane Isabel (September 2003)= 6.4 feet NAVD88



Summary of Key Elevations

Flooding Through Storm Drains – 1.9 feet NAVD88

Extreme High Tide in March 2018 – 2.7 feet NAVD88

Protection after Flood Mitigation project – 3.2 feet NAVD88

Ten Year Storm Elevation – 3.7 feet NAVD88

Base Flood Elevation (100-Yr Storm) – 5.0 feet NAVD88

Hurricane Isabel (September 2003) – 6.4 feet NAVD88

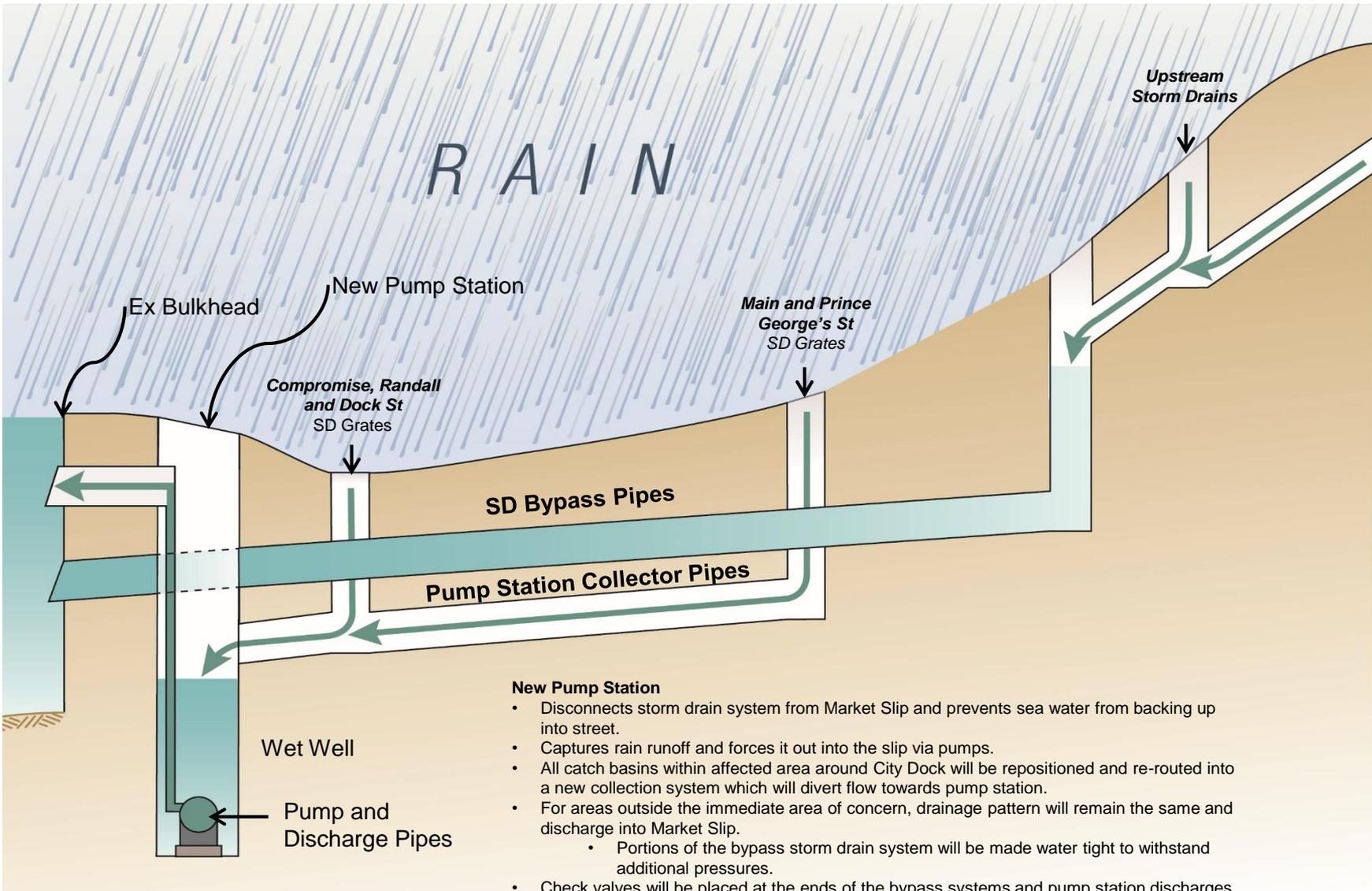


Features of Proposed Flood Mitigation System, Phase 1 Southside of Ego Alley/Compromise Street/Newman Park

- Storm Drain Improvements
 - Bypass System
 - Localized System
- Pumping Station/ Wet Well
- Control Building with Emergency Back-up Generator
- Grading Modifications (minor)
 - Newman Street Seawall
 - Handicapped Ramp tie-in at Compromise Street



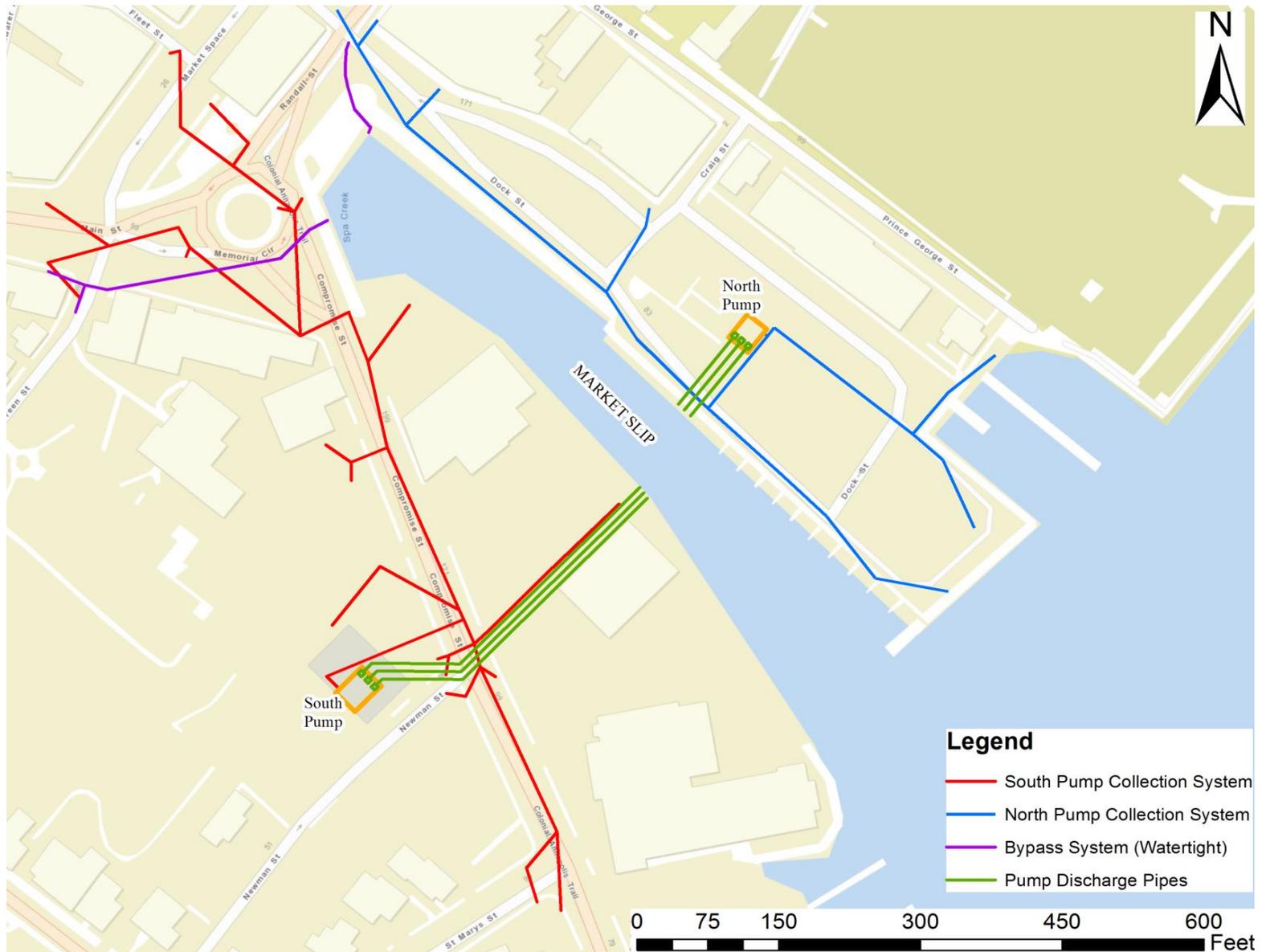
Proposed Solution Schematic



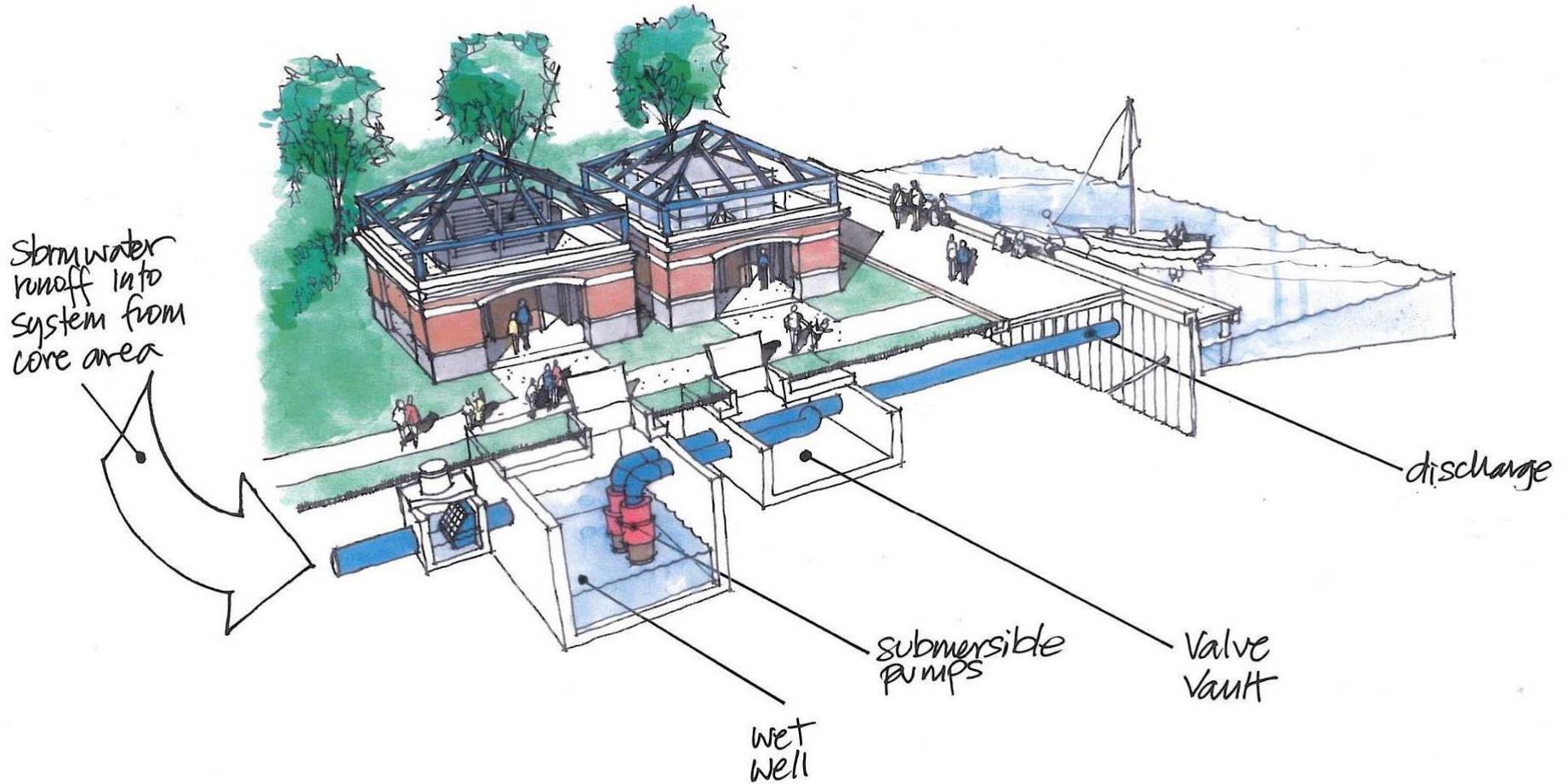
New Pump Station

- Disconnects storm drain system from Market Slip and prevents sea water from backing up into street.
- Captures rain runoff and forces it out into the slip via pumps.
- All catch basins within affected area around City Dock will be repositioned and re-routed into a new collection system which will divert flow towards pump station.
- For areas outside the immediate area of concern, drainage pattern will remain the same and discharge into Market Slip.
 - Portions of the bypass storm drain system will be made water tight to withstand additional pressures.
- Check valves will be placed at the ends of the bypass systems and pump station discharges.

Proposed Storm Drain Improvements



Typical Pump Station Schematic



Filtration of Storm Water at Pump Stations

- Two critical questions regarding the addition of filtration:
 - Is filtration required by law or regulations? **NO**
 - Is filtration recommended to meet the anticipated requirements of the City's MS4 permit expected to be issued in the near future? **NO**
- AECOM prepared the City's Watershed Improvement Plan (WIP) and is the design engineer for the flood mitigation project.
- The WIP identified 16 cost effective projects ("low hanging fruit") to meet the MS4 permit's requirement to treat 20% of the city's untreated impervious surface.
- Filtration of the storm water at City Dock is **not** the most cost effective way to meet the MS4 permit requirements.
- Filtration may be added in the future if higher MS4 requirements are imposed

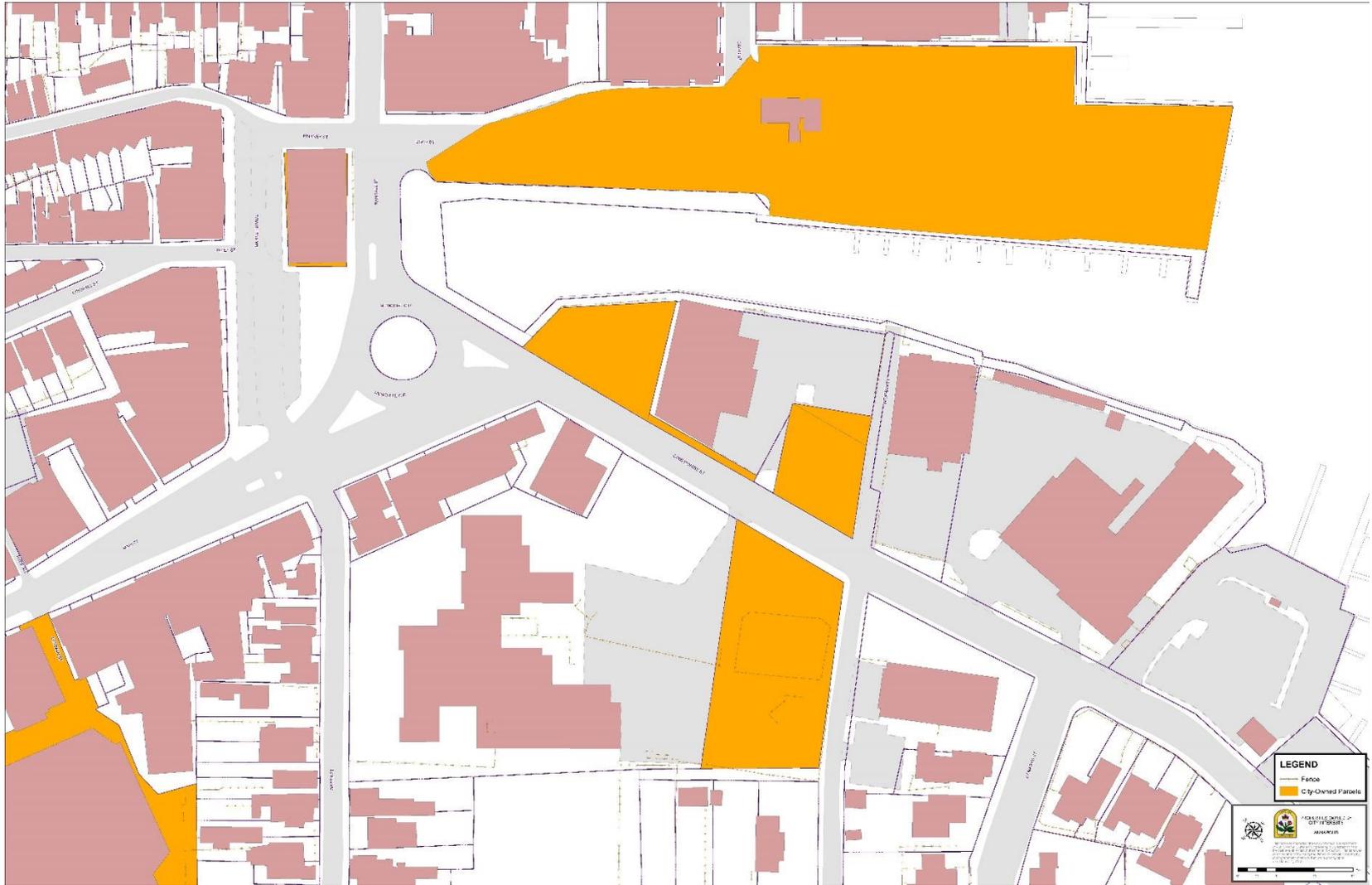


Pump Station Control Building Location

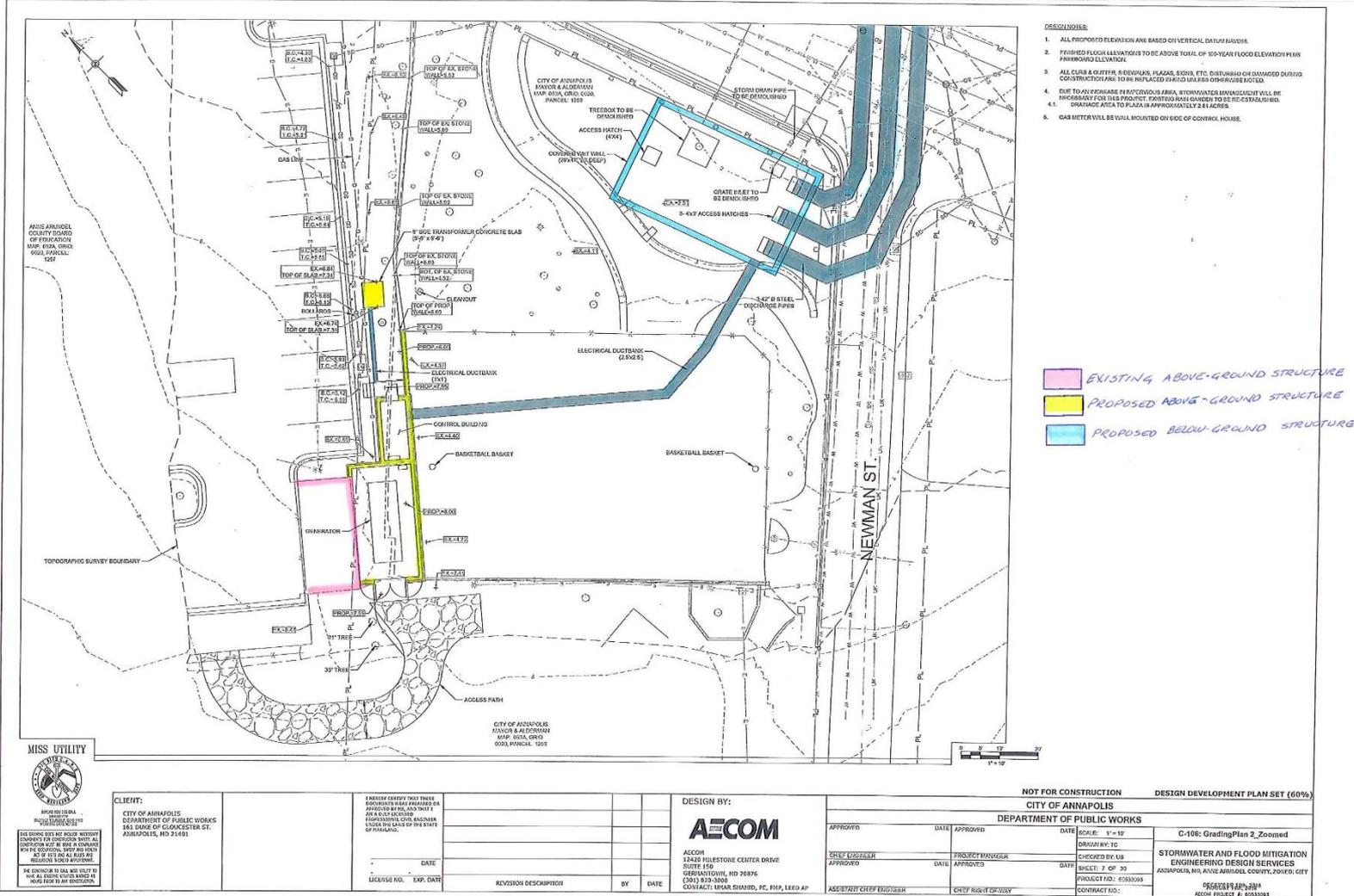
- Proposed hotel on Dock St. was considered as potential Control Building location but not selected due to uncertainty surrounding the project and its schedule.
- The Newman St. parking lot was considered but not selected due to existing low elevations, impact on waterfront viewshed and Boat Show plans for main entrance at that location. HPC indicated that they would not approve this location for the pump control building.
- HPC pre-application hearing was held on Tuesday, April 10th. HPC members unanimously recommended two site locations and building configurations as the best alternatives.
- 14 alternative site locations were considered at Newman Park.
- Many alternative building configurations were evaluated, using a building block approach.



Map of City-owned Parcels



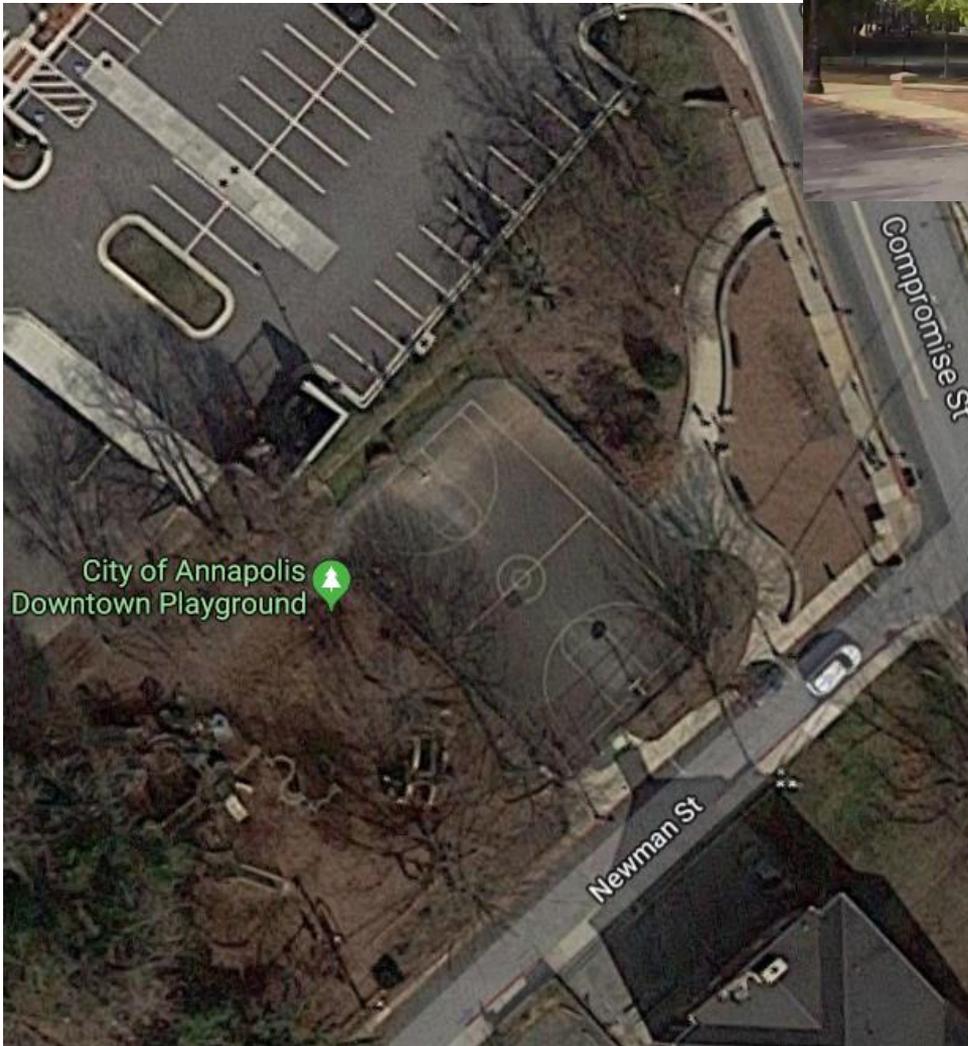
Pump Station Control Building and Wet Well Site Plan Newman Park – Phase 1



Phase I Pump Station Control Building



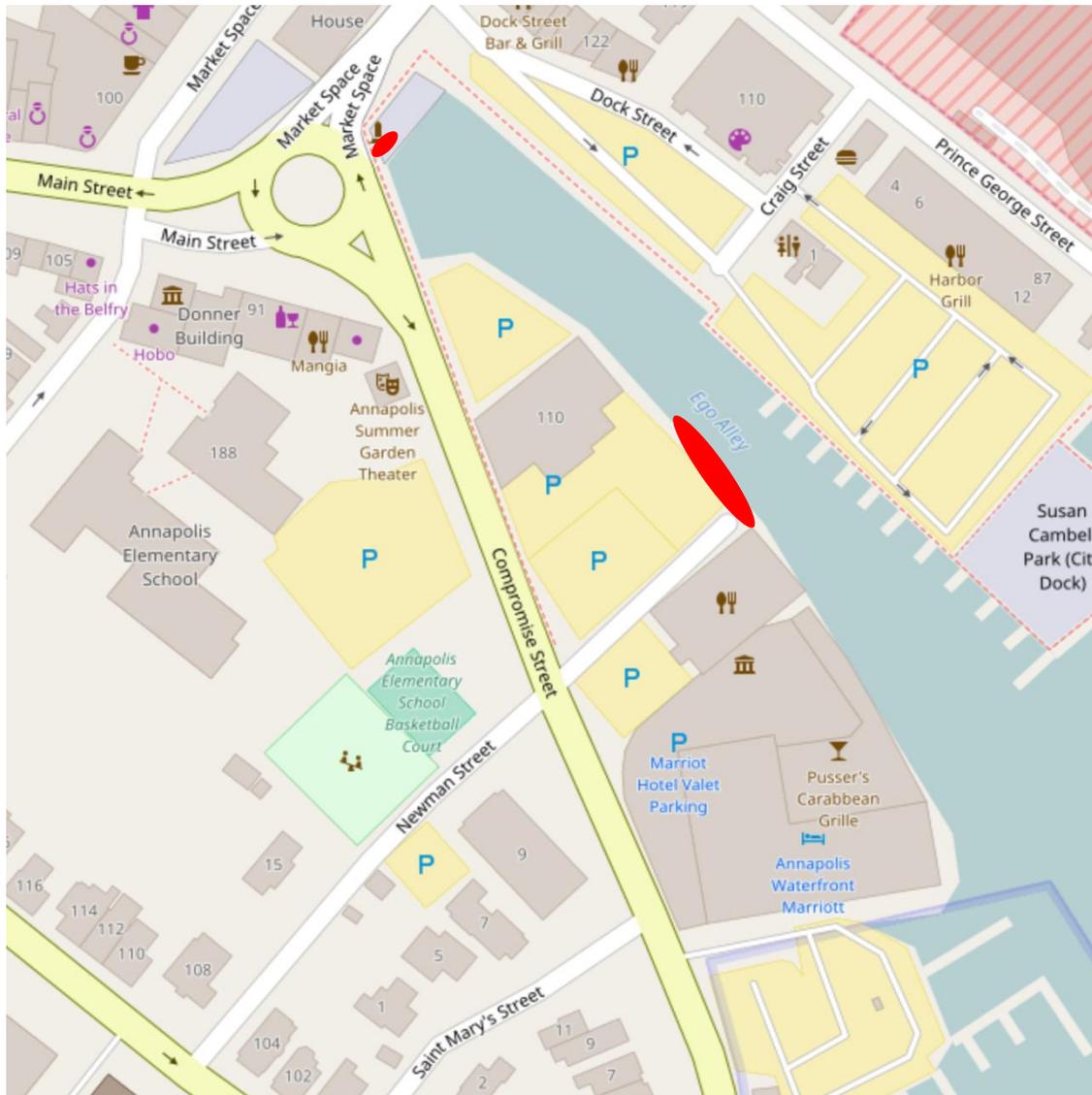
Newman Park Plaza



Open House will be held
December 4th to discuss
“re-imagining” the plaza
along Compromise Street



Grading Modifications



Goal: Provide consistent level of protection around Market Slip up to EL 3.2 feet.

Dinghy Dock

- Handicap ramp to be reconstructed 3 inches higher while maintaining ADA accessibility.
- Flooding from high tide contained within brick plaza.

Newman Street

- Raise approximately 100 feet of existing concrete wall from EL 1.5 feet to EL 3.2 feet.



Project Funding

- Design of Phase 1 & 2: \$1 million (State funded)
- Phase 1: Compromise Street (south) side of City Dock
 - FEMA Grant - \$3 million (awaiting approval of the grant)
 - City Contribution - \$1.5 million
 - Funding from State - \$2 million
 - **TOTAL COST - \$6.5 million (FY 2019 funding)**
- Phase 2: Dock Street (north) side of City Dock
 - **TOTAL COST - \$4.5 million (currently unfunded)**



Project Timeline

- Public Input – ongoing
- 2nd HPC Pre-App Meeting – April 10, 2018
- HPC Application Meeting (at 50% design) – June 2018
- Feedback from FEMA on grant application – June 2018
- Complete Design Documents – December 2018
- Construction Bidding and Project Permitting – 2018 / 2019
- Phase 1 Construction Start – March 2019
- Phase 1 Construction Completion – August 2020
- Phase 2 Construction Start & Completion – TBD



Phase I Project timeline

- Initiate Design Development – December 2017
- Public Input on concept design – completed in August 2018
- Open House for Plaza re-design – December 4, 2018
- HPC Application Public Hearing – February 12, 2019
- Approval of FEMA grant application – Unknown
- Complete Phase 1 Design Documents – September 2019
- Construction Bidding – Fall 2019
- Phase 1 Construction– January 2020 through Fall 2021
- Phase 2 Construction Start and Completion – TBD



Send Comments to:
Lmgrieco@annapolis.gov

Project Information:

<https://www.annapolis.gov/1416/City-Dock-Flood-Mitigation-Project>

